Empirical study estimating volatility dynamics of stock returns of Banks in India

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***Abstract*— The major purpose of this exercise is to assess the volatility dynamics of the stock returns of the banks of India and to determine the factor which influence and explains the stock returns. For this exercise, the methodology GARCH (1, 1) model is used for determining the risk factor under multi index model. The empirical exercise suggests that in case of banking companies stock returns are highly persistent and lagged returns have a significant impact on the current year's stock returns**

***Index Terms*— Stock returns, volatility estimation and GARCH.**

I. INTRODUCTION

Liberalization across developing nations caused widespread exposure of different elements of risk especially to multinational organizations. Financial Industry per say is more venerable to such exposure and experience different risk in their operational areas. With the economic crisis of 2008 affecting the globalized world, banks had to face the direst consequences due to very nature of their business. All the policy makers, regulators, academic fraternity and investors, today are worried for the health of banks in their economies. Banks being the nucleus center in the economy, their stock price experience shocks due to unprecedented movements in interest rates and exchange rates. Sensitivity in interest rate severely affects the balance sheets of banks if the maturities of assets and liabilities are not matched properly. Such impacts on balance sheet can deteriorate the financial position of the bank, causing the banks to maintain higher regulatory capital for meeting contingencies and thereby reducing its capability of financial intermediation. Moreover, even in situations where bank is able to match the maturities of assets and liabilities successfully, the devaluation in local currency will have negative consequence on the balance sheet and may lead to default on their loans.

Unlike other emerging economies, India's structure of banking industry is fractured, in the sense, there exits Government owned commercial banks, private banks, foreign banks and cooperative banks. With such diversity in ownership structure and existence of multi-layer structure of banking industry in India, different categories of the banks will have different bearing of sensitivity on their stock returns. Our effort in this study will be to find this impact of sensitivity in the selected factors. The empirical study will not only try to fill the gap in the literature as this seems to be the principal attempt to conduct such detailed joint assessment of these variables on Indian bank's stock returns but also employ the application of OLS and GARCH model for empirical analysis in anticipation that the findings of this study will work as an input for policy makers.

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II. RESEARCH OBJECTIVE

To examine the volatility dynamics of Banks' stock returns. This analysis will help in identifying the interbank volatility structure of individual banks and their effect on the banking industry in particular and stock market in general, as well. This analysis will not only provide the influence of past years stock returns on the current years stock returns but also give information on any impact created in the stock markets on account of any significant news coming in the market. We also intend to find the existence of persistency in the time series data of stock returns.

III. LITERATURE REVIEW

The study of volatility in banking company's stock returns had been conducted with several models in past. Under the CAPM model, [30] took interest rate as an extra market factor in pricing securities return which is referred as Intertemporal Capital Asset Pricing Model (ICAPM). The main finding of his paper was investors anticipate additional compensation for bearing the risk of change in interest rate. Also, the implications of Arbitrage Pricing Theory (APT) provide evidence of whether interest rate [39] or exchange rate risk are priced factors in the equilibrium price of bank stocks. In equilibrium, interest rate [41] and exchange rate sensitivities exercise a significant impact on the common stocks of financial institutions, including banks. With the liberalization in financial market, most of the banks carry out their operations in foreign countries and are eventually exposed to the array of risk in recent years. More prominently, interest rate and exchange rate changes have a significant effect on the viability of banks because their impact cannot be eliminated through risk management techniques [19]. The major challenge has been for banking companies of emerging economies as these banks are more susceptible due to paucity of sophisticated technology and insufficiency of innovative instruments and techniques.

The previous findings do strongly establish the sensitivity in pricing factors on bank's stock returns; however, there have been very limited empirical studies. Moreover, all the previous studies are built on the restrictive assumptions of linearity, constant and independent variances in modeling stock returns of banks. The reason being these studies applied the ordinary least square (OLS) and the generalized least square (GLS) methodologies for assessing the impact of volatility in selected risk factors on stock returns. Until [36] made the first attempt to apply Auto Regressive Conditional Hetertoskedasticity (ARCH) model to quantify volatility in

especially in banking sector. [17] applied the [12] GARCH model to conclude that market risk and interest rate risk are significant elements for non-banking finance companies, however, for banking companies, the interest rate sensitivity was found less significant. However, a major challenge with their methodology emerged was the bias coefficients and lack of consistency of the measurement factors as they are assumed to be time invaring. Thus it is quite prevalent that in order to build a parsimonious banking companies stock returns model is to remove the time invariability which will make the model more reflective and representative to capture the sensitivity in banking companies' stock returns.

IV. The Research Methodology:

We intend to examine the volatility dynamics in banks stock returns through the application of the GARCH model. To address the issue of volatility dynamics, we aim to assess the unexpected movement of bank stock returns to change in its volatility. For this, we will apply [6] process of generalized ARCH or as commonly referred as GARCH *(p, q).* The stock return Y_t is described in a model form as follows.

$$Y_t = YF(X_t) + \varepsilon_t \qquad (1)$$

Where for some liner function $F(.)$ with $X_t = (1, Y_{t-1}, \ldots, Y_{t-p})$, such that ε_t has got the following properties.

$$E[\varepsilon_t | \ \Omega_{t-1}] = 0$$

$$E[\varepsilon_t^2 | \ \Omega_{t-1}] = h_t$$

Where Ω_{t-1} is the information set available at time *t*-1.

$$h_t = \omega + \sum_{j=1}^{q} \alpha_j \varepsilon_{t-j}^2 + \sum_{j=1}^{p} \beta_j h_{t-j} \qquad \ldots (2)$$

The above model will generate the estimates for coefficients of $\omega, \alpha \text{ and } \beta$ which will help us to examine the volatility dynamics of stock returns of banks for the period under the study. The GARCH model, can be used with an exception of three distributions viz, normal Gaussian, student-t and generalized error distribution (GED). For this research exercise, we assumed normal Gaussian distribution and thus the other distribution that is student-t and GED estimations have been left for future research quests.

V. The Data

The study is proposed to be conducted for a sample period of ten years daily closing index starting from 2000 to 2010. We propose that selection of all the banks listed in National Stock Exchange of India (NSE). At present, there are twenty public sector and sixteen private sector banks listed on NSE making thirty-six banks in all. The NSE also has a bank benchmark index called as CNX Bank Index which has the representation of twelve banks out of the thirty-six banks. This index will comprise the market index for the study. The daily closing stock prices of selected banks and market index return are available on the National Stock Exchange (NSE) website. The returns of the banks have been calculated using the log transformation process $Y_t = lnY_t/lnY_{t-1}$, where Y_t is the stock price at time *t* and Y_{t-1} is the stock price at time *t-1*.

VI. Empirical Analysis for Volatility Dynamics:

The stock returns of the all the selected banks listed on Indian National Stock Exchange (NSE) are collected and first time series analyzed individually for all the banks. Table 1, reveals the bank's stock returns descriptive statistics. We shall first explain all the dynamics of time series of daily stock returns separately for all the banks from 2000 to 2010.

The study has coverage of thirty six banks listed on NSE, out of which twenty banks are public sector banks and sixteen are private sector banks. As seen from the Table 1, Public sector banks (Figure 1) have shown majority negative average daily stock returns for the period of study. Out of twenty banks, only five banks have given positive mean daily returns during the period of study. Allahabad Bank, Dena Bank, Federal Bank, State Bank of Bikaner and Jaipur and State Bank of Mysore, revealed positive average daily returns, of which Allahabad Bank had the maximum daily stock return of 0.15% and State Bank of Mysore had the least daily stock return of 0.05%. Allahabad Bank, Federal Bank and State Bank of Mysore had negative skewness means; they had major concentration of returns on the left side of the distribution and had relatively few low values of returns. On the contrary, Dena Bank and State Bank of Bikaner and Jaipur had positive skewness means; it had right tail and had relatively few high values. The value of kurtosis of these five banks had been greater than three and a case of positive excess kurtosis also termed as "leptokurtic". Such distribution depicts more acute peak around the mean and fatter tails.

Insert Figure 1

The residual fifteen public sector banks had negative average daily returns for the period selected out of which UCO bank had the least average daily returns. Seven out of fifteen banks had a negative skewness suggesting a left tail was longer as the mass concentration of observations was towards the right with majority lower values. Seven of the fifteen banks had kurtosis value near three and the rest had kurtosis value greater than three. Thus, the primarily analysis of average daily returns of the selected banks had been justifying and are in-line with the stylized facts of the asset returns [7](*Campbell et al, 1997*).

The private sector banks (Fig. 2) had not been different than their public sector counterparts. They have similar dynamics pattern for their time series of stock returns. Out of total sixteen private sector banks, only five had a positive average daily returns for the period of study, out of which Yes bank had the maximum stock return of 0.20% and South Indian Bank the least -0.09% stock returns. Analysis of skewness shows that majority of the private sector banks returns had negative skewness clearly showing a left tail is longer and few lower values of returns in the total distribution of returns. Except for Yes Bank the rest of the private sector banks had a high value of Kurtosis, higher than three. This means the banks which had excess Kurtosis, their returns distribution had been peaked around its mean value and had fatter tails.

Insert Figure 2

Finally, we also analyzed the time series of CNX bank index of NSE which comprises of twelve major banks of the industry. The data series of ten years of the index is consistent with the individual bank stock returns. The Negative skewness -0.15 and excess kurtosis value 4.16, reveal that the bank index returns distribution for ten years shows a left tailed and leptokurtic. The average daily return had been 0. 053%

and this return ranged between +8% and -8%. This shows that the banking industry combined per say had a fairly low level of volatility. However, just from the range of the maximum and minimum return will not give us clear picture of volatility dynamics experienced by the banking industry as a whole. Thus, it becomes evident now to discover the volatility pattern of the banking industry as a whole and individual bank as well. Such analysis will not only help to determine the level of volatility caused in the entire banking industry but also help to identify which bank contributes majority in this volatility and which least.

Insert Table 1

Insert Figure 3

Fig. 3 illustrates the daily close and stock returns dynamics of CNX bank index comprising of twelve major banks of India. The returns had been fairly consistent and rather increasing moderately till 2004. In the year 2004 the industry experienced a minor fall which is followed in the year 2006. However, the difference between the fall of 2004 and 2006 is not same. The year 2004 experienced a sudden fall in the index on the contrary 2006 fall was gradual. This can be inferred from the stock returns figure 4 was it is clearly seen that in 2004 the volatility was extremely high and then subsequently, returning to normal range of stock returns. A major patternof volatility which immerged from the data series is the volatility experienced in the year 2008 and thereafter. The impact of financial crisis had left a cascading effect on the banking industry, which resulted in fall in the index for a long time. This effect created an environment of uncertainty and low confidence among the traders and investors resulting in very high level of volatility experienced during this period. Thus we will now make a deliberate attempt to analyze the volatility dynamics of the banking industry stock returns.

The parameter estimates for GARCH (1, 1) model is presented in the following Table 2. We have estimated ω, α and β the three important parameters of the model stated in equation 2 for all the banks individually and the market as a whole. The parameter ω gives the impact of any news or event which caused sudden turmoil in the market causing the variance in stock returns drastically, the next parameter, β is the ARCH parameters which finds the impact of lagged squared error term on the current period variance of stock returns and the last parameter α is the GARCH parameter which assesses the impact of lagged period variance on the current period variance.

The analysis of all the banks and the market index has discovered that all the three parameters estimated are statistically significant at assumed 1% level of significance. The value of ω, which is constant volatility, for all the banks and the index is very close to zero which suggests that the constant variance had negligible impact on volatility of the stock returns of the banks. The GARCH (Beta) and the ARCH (Alpha) coefficients for all the banks are also very statistically significant at 1% assumed level of significance. This implies that lagged residuals square and the lagged variance have a significant impact on the current variance of the stock returns. Moreover, the sum of two coefficients GARCH (Beta) and the ARCH (Alpha) is very close to one. This gives a very clear understanding of high persistence in the variance. This persistency illustrates that every fall in stock returns is followed by fall and every rise is followed by rise.

Insert Table 2

Insert Figure 4

Fig. 4, shows the conditional variance of nine banks together. It is observed that Andhra Bank(AnB), Bank of India (BOI), Canara Bank (CanB) and Corporation Bank (CorpB) had experienced a very high level of volatility in their returns and Allahabad Bank (AllB), Bank of Baroda (BOB), Bank of Maharashtra (BOM), Dena Bank (DB) and Federal Bank (FedB) had relatively low sensitivities in their stock returns, however, all the nine banks had high volatility during the two important period sighted earlier the fall of 2004 and the financial crisis of 2008. Financial crisis did not caused volatility in the returns of all the banks. Referring to the conditional volatility of the above nine banks, it can be inferred that BOB and BOM had a relatively low impact of crisis on their returns.

Insert Figure 5

Fig. 5 gives the conditional variance of eight of the banks selected for the study. Here in figure 6 we can observe that Indian Overseas Bank (IOB), Oriental Bank of Commerce (OBC), Punjab National Bank (PNB), State Bank of India (SBI) and Union Bank of India (UBI) had major volatility pattern and the rest have relatively low volatility pattern. These banks are big banks compared to others who are relatively smaller ones and hence, they had lover volatility in their conditional variance. PNB, OBC and IDBI had shown increased volatility at the beginning of the period and the others had increased volatility at the end of the period of study. SBI, UBI and IOB had been the major banks which experienced increased volatility at regular intervals suggesting these bank's stock returns had been highly volatile during the last decade.

Insert Figure 6

Fig. 6 gives the relative comparison of conditional variance of other nine banks, this time these bank are private sectors banks. Looking to the conditional variance of these nine private sector banks, it is evident that Karnataka Bank (KB), City Union Bank (CUB) and HDFC Bank (HDFC) had experienced a low level of activity causing low volatility on their counters. HDFC Bank is one of the biggest bank of the India, and had relatively low volatility among others clearly reveals that the performance of this bank had been consistent make its stock returns fairly consistent as well on a daily basis. However, Axis Bank (AxB), Development Credit Bank (DCB), Dhanlakshmi Bank (DhanB), ICICI Bank (ICICI), IndusInd Bank (IndB) and Jammu and Kashmir Bank (J&KB) had similar high level of volatility patterns as observed in other banks.

Insert Figure 8

Fig. 8 gives the conditional variance of the last set of six banks selected for this exercise. KarurVysa Bank (KVB), Kotak Bank (KB), Lakshmi Vilas Bank (LVB), South Indian Bank (SIB) had seen a low volatility and only few spikes, giving understanding that these banks had only few occasions were volatility had spurted and then returned to its normal condition. However, that was not the case for Vijaya Bank (VB) and Yes Bank (YB), who had fairly high level of volatility on their counters. VB as seen in the figure had continues patterns of high spikes making this bank stock returns highly volatile. YB also had an active counter with increased volatility observed during later period during the decade as seen in the figure 7.

VII. DIAGNOSTIC TESTING

It is been seen that size of the bank is not a factor which influenced the volatility on their stock returns. Some big size banks had quite calm volatility patterns and few small banks had a very active volatility patterns. However, this model of volatility has needs to be tested using the diagnostic testing. Thus, our next task is to check the validity of this GARCH model, which we propose by testing, weather the residuals are auto-correlated, normally distributed and existence of ARCH effect. For testing on these three stages, we propose the following null hypothesis and alternate hypothesis.

Null HypothesisH_0 (1): The residuals from the model are not serially correlated

Alternate Hypothesis H_1(1): The residuals from the model are serially correlated.

Null Hypothesis H_0(2): Residuals are normally distributed.

Alternate Hypothesis H_1(2): Residuals are not normally distributed.

Null HypothesisH_0 (3): ARCH effect does not exists in the residuals.

Alternate HypothesisH_1 (3): ARCH effect does exists in the residuals.

To test the first null hypothesis on serial correlation (1), we calculated correlograms of the autocorrelation and partial autocorrelation of the squared residuals with thirty lags and also computed the Ljung-Box Q-statistics for the each corresponding lag and there p-values. We also conducted the ARCH LM (3) test of heteroskedasticity. It is observed from the tests conducted on all the banks individually and on the market index, that only UBI, AxB, KB and SIB are the banks were the two null hypothesis of residuals not serially auto-correlated and non-existence of ARCH effect are rejected at 5% significance level as their corresponding p-values generated from the two tests are less than 5% and for all the rest of the banks and CNX bank Index, the null hypothesis is not rejected. As the null hypothesis of these four banks is rejected their conditional variance contains ARCH or GARCH errors. However, in case of other banks, such errors do not exist in conditional variance. Hence, the remaining bank's conditional variance is comparatively giving a more realistic measure of volatility dynamics. This shows that residuals from the GRACH model with normal distribution for the majority of the banks are not serially correlated and does not contain the issue of heteroscidasticity. The detailed summary of diagnostic test results is presented in the following Fig. 9. Finally, we conducted the last test on residuals of GARCH model of normality. For conducting normality test we used the Jarque-Bera statistics and its corresponding p-value. The test result reveals that none of the banks had residuals normally distributed as all the banks Jarque-Bera statistics p-value are less than 5% statistical significance level. Thus, for the last test, we reject the null hypothesis (2) and derive the result that the model's residuals are not normally distributed. Any model, to be used for forecasting requires the three diagnostic test null hypotheses being not rejected to make the model's coefficients consistent and efficient. If the model's coefficients pass the diagnostic test, then these coefficients can be used for out of sample forecasting and such forecast will generate more accurate results for decision making for future. However, due to the inherent issue present in the economic time series as discussed earlier, to get residuals normally distributed is very difficult. Hence, this model can be implemented for forecasting with a paramount assumption that residuals are normally distributed. By giving such assumption, the model coefficient can be used consistently for forward planning and decision making for future through a near to accurate forecast.

VIII. CONCLUSION

The current research is structured in three broad categories. In the first segment, we analyzed the banks stock returns using the GARCH (1, 1) model. The purpose of application of GARCH was to assess the volatility dynamics of the individual bank's stock returns for the period under the study which will help in understanding the variance. According to our findings, the stock returns variance equations coefficients are highly significant. The estimation of the model, suggested that the stock returns are highly persistent. Out of the total thirty six banks undertaken for the research, only three banks had statistically insignificant coefficients. However, it has also been observed that certain significant shocks had cascading impact in the time series. The analysis of conditional variance has given this common impact on the time series of majority of the banks. The crisis period had major impact on the volatility of the stock returns of the banks. The stock returns, showed high degree of variances and these were consistently followed in the subsequent years. Hence, the findings showed that banks which were highly traded and were listed long time on the stock exchanges were the banks who observed high volatility and their returns experienced the impact of news in the market. On a broad classification, public sector banks had experienced major shifts in volatility compared to their private sector counterpart. This finding is made on the basis of observation made to the conditional volatility of all the banks. Moreover, the ARCH and the GARCH coefficients were highly significant and their summation was unity, this finding suggests that the returns data is highly persistent.

APPENDIX

FIGURE 1:
PUBLIC SECTOR BANKS AVERAGE DAILY RETURNS

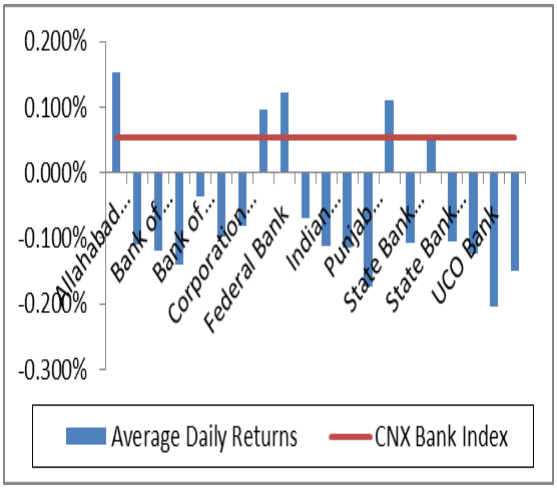


FIGURE 2:
PRIVATE SECTOR BANKS AVERAGE DAILY RETURNS

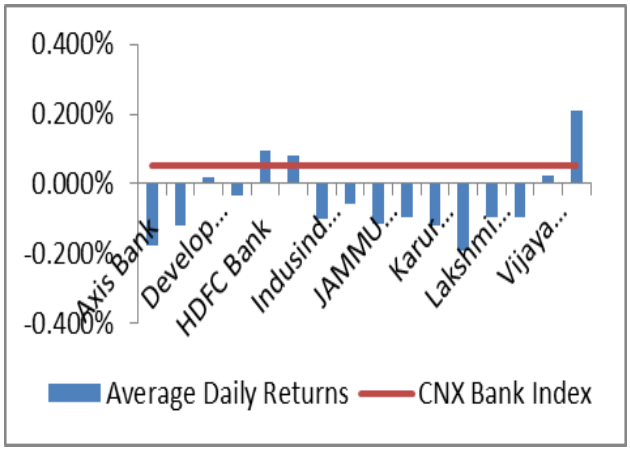


FIGURE 3:
CNX BANK INDEX DAILY CLOSE & RETURNS

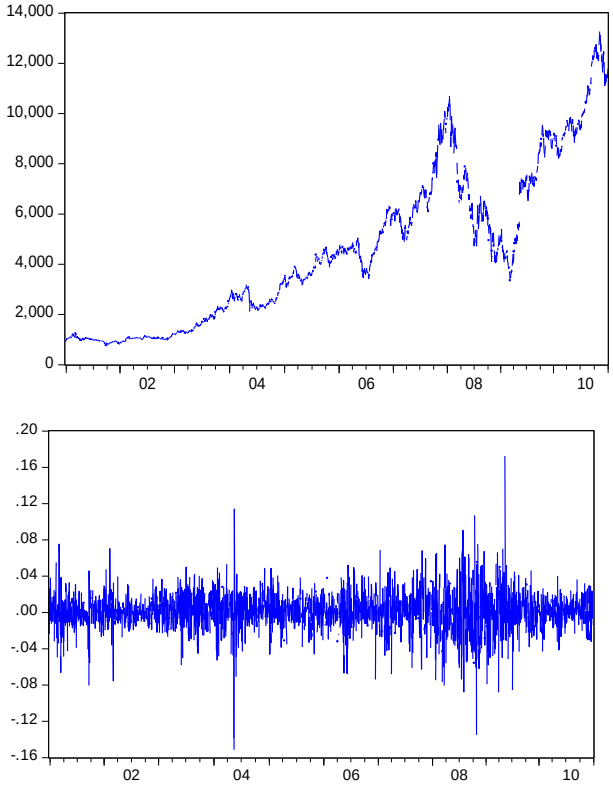
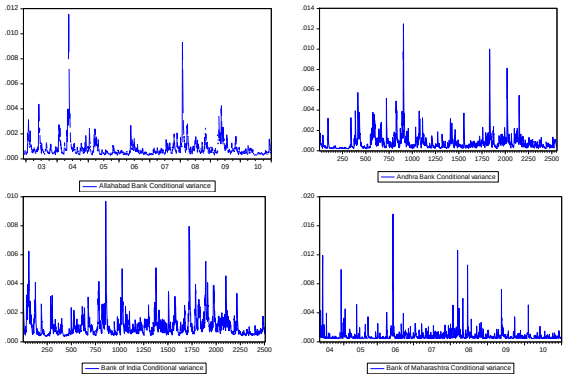


FIGURE 4: CONDITIONAL VOLATILITY



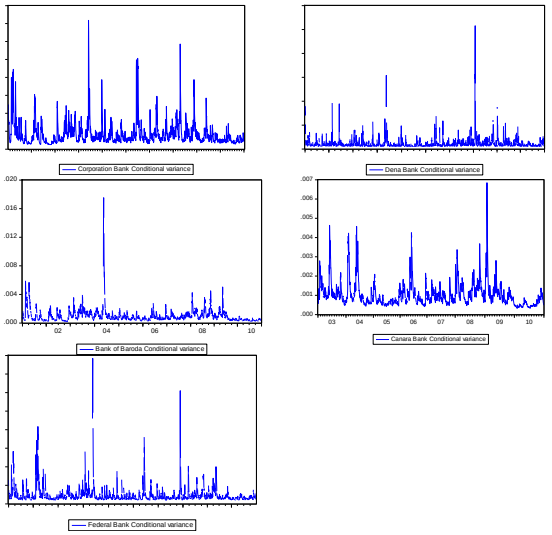


FIGURE 5: CONDITIONAL VOLATILITY

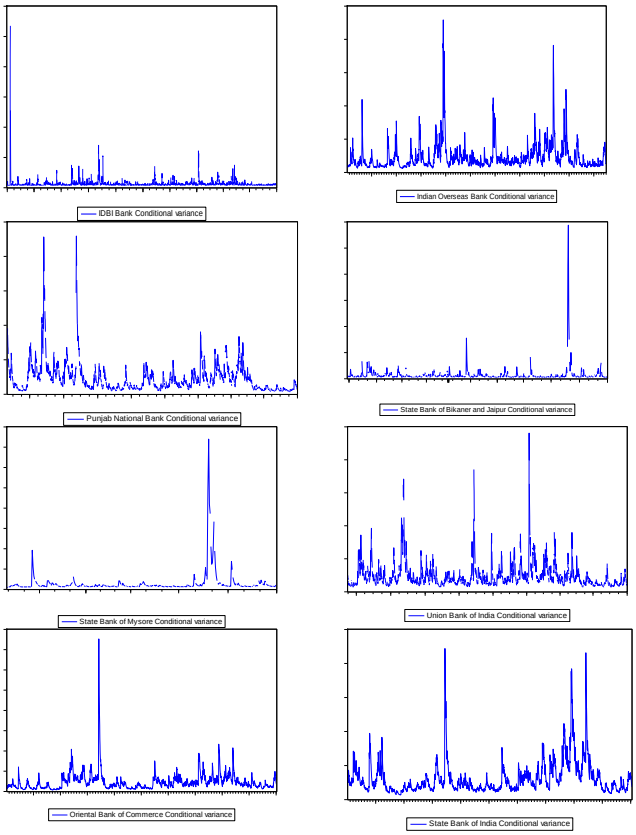
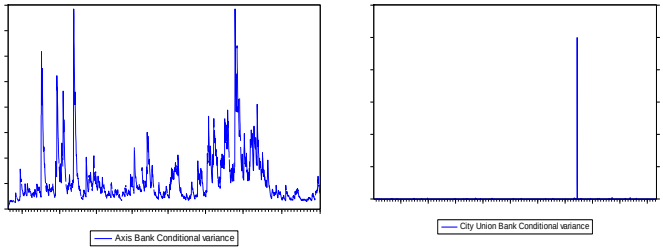


FIGURE 6: CONDITIONAL VOLATILITY



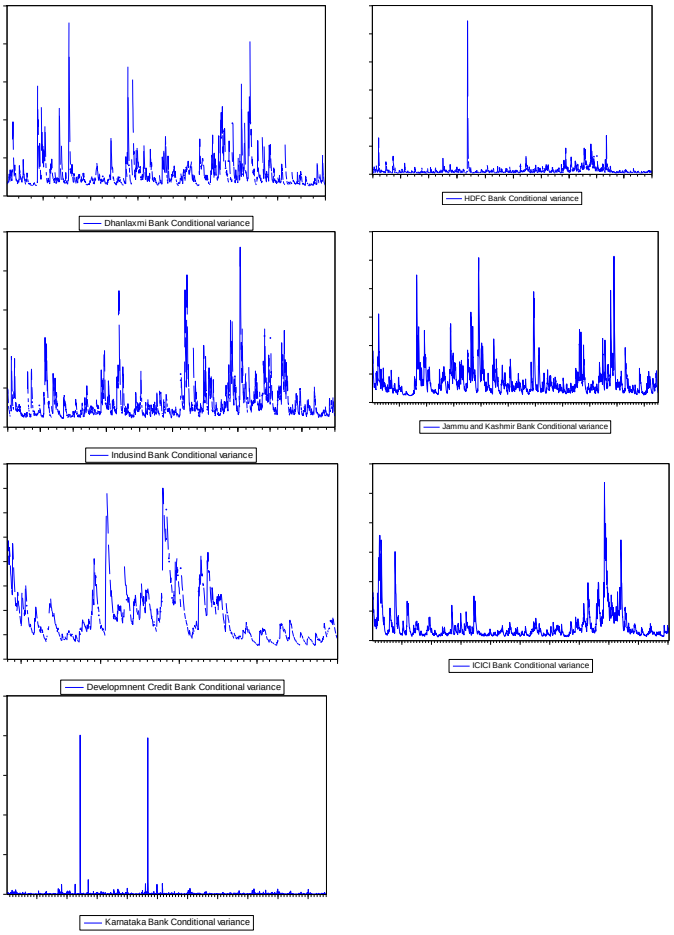


FIGURE 7: CONDITIONAL VOLATILITY

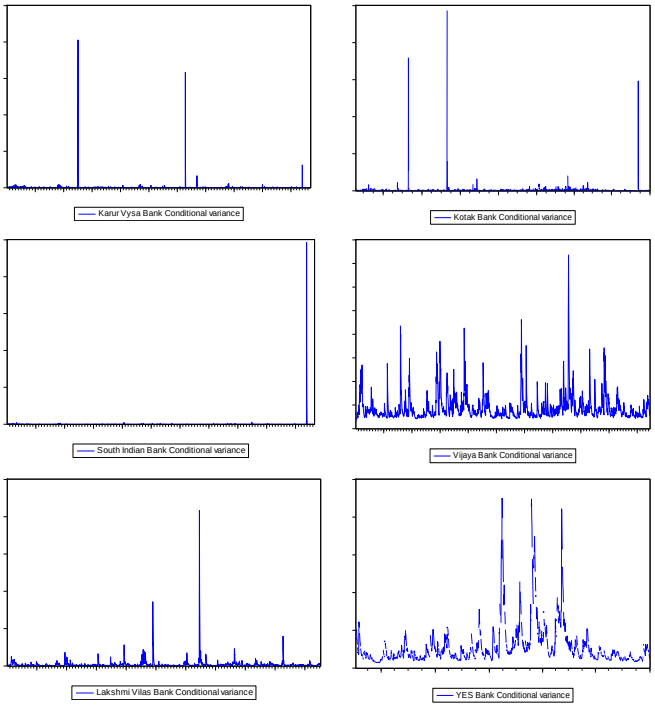


TABLE 1: DESCRIPTIVE STATISTICS

Name of Banks	Mean	Standard	Minimu	Maxim	Skewness	Kurtosis
Public Sector Banks						
Allahabad Bank	0.154%	0.02875	-19%	17%	-0.02836	4.78607
Andhra Bank	-0.109%	0.02900	-16%	20%	0.16878	4.43700
Bank of Baroda	-0.118%	0.03052	-18%	24%	0.07392	5.31195
Bank of India	-0.140%	0.03314	-20%	23%	0.06456	3.69850
Bank of Maharashtra	-0.035%	0.02805	-18%	17%	-0.48235	7.42803
Canara Bank	-0.097%	0.02999	-15%	17%	0.08013	3.15946
Corporation Bank	-0.082%	0.02807	-16%	19%	-0.27022	4.65131
Dena Bank	0.097%	0.03315	-24%	24%	0.22631	5.62006
Federal Bank	0.123%	0.03046	-25%	18%	-0.06853	7.49551
IDBI Bank	-0.070%	0.03442	-18%	23%	-0.18857	5.16985
Indian Overseas Bank	-0.112%	0.03007	-18%	22%	0.15661	4.48848
Oriental Bank of Commerce	-0.114%	0.02869	-19%	19%	-0.07116	3.38042
Punjab National Bank	-0.173%	0.02916	-16%	20%	-0.04522	3.22192
State Bank of Bikaner and Jaipur	0.111%	0.02419	-7%	18%	1.74692	12.02150
State Bank of India	-0.107%	0.02465	-18%	15%	0.09110	3.99949
State Bank of Mysore	0.053%	0.02023	-11%	13%	-0.60502	9.86219
State Bank of Travencore	-0.104%	0.02379	-8%	10%	0.00874	1.90994
Syndicate Bank	-0.124%	0.02698	-13%	16%	0.79543	5.37124
UCO Bank	-0.204%	0.02872	-15%	11%	-0.32956	2.97590
UNION Bank of India	-0.150%	0.02504	-14%	12%	-0.02496	3.12702
Private Sector Banks						
Axis Bank	-0.179%	0.03308	-19%	22%	-0.28222	4.85419
City Union Bank	-0.118%	0.02766	-18%	17%	-0.37162	6.17788
Development Credit Bank	0.017%	0.04108	-20%	21%	0.45820	3.48152
Dhanlaxmi Bank	-0.031%	0.03234	-11%	18%	1.52475	7.48791
HDFC Bank	0.095%	0.02272	-23%	23%	0.19201	11.07330
ICICI Bank	0.080%	0.03093	-22%	21%	-0.07687	5.07274
Indusind Bank	-0.102%	0.03488	-16%	19%	-0.07625	3.61036
ING Vysa Bank	-0.059%	0.02859	-18%	12%	-0.71940	4.25040
JAMMU & KASHMIR Bank	-0.116%	0.02645	-18%	15%	-0.62981	5.49809
Karnataka Bank	-0.097%	0.02979	-19%	14%	-0.64286	5.22656
Karur Vysa Bank	-0.119%	0.02359	-16%	15%	-0.71216	6.41284
Kotak Bank	-0.189%	0.03213	-18%	17%	-0.22762	3.31454
Lakshmi Vilas Bank	-0.094%	0.03003	-18%	19%	-0.83097	8.15378
South Indian Bank	-0.097%	0.03003	-19%	21%	-0.39452	5.34378
Vijaya Bank	0.021%	0.02563	-9%	18%	1.04072	8.38605
YES Bank	0.208%	0.02579	-9%	12%	0.74185	2.32897
CNX Bank Index	**0.053%**	**0.01625**	**-8%**	**8%**	**-0.15453**	**4.16097**

TABLE 2: PARAMETERS ESTIMATES OF BANKING STOCK RETURNS VOLATILITY

Name of Banks	ω	β	α
Public Sector Banks			
Allahabad Bank	0.0000511***	0.155225***	0.786747***
Andhra Bank	0.0000431***	0.228325***	0.740148***
Bank of Baroda	0.0000313***	0.13958***	0.836012***
Bank of India	0.0000865***	0.161887***	0.765326***
Bank of Maharashtra	0.000301***	0.35073***	0.316857***
Canara Bank	0.0000407***	0.102851***	0.860927***
Corporation Bank	0.0000486***	0.140672***	0.807252***
Dena Bank	0.000248***	0.276182***	0.508862***
Federal Bank	0.00011***	0.176769***	0.710944***
IDBI Bank	0.000436***	0.213839***	0.442547***
Indian Overseas Bank	0.0000348***	0.128581***	0.837377***
Oriental Bank of Commerce	0.0000141***	0.113569***	0.880496***
Punjab National Bank	0.0000127***	0.116796***	0.873834***
State Bank of Bikaner and Jaipur	0.000137***	0.417869***	0.370329***
State Bank of India	0.0000125***	0.090094***	0.89174***
State Bank of Mysore	0.000103***	0.27162***	0.550655***
State Bank of Travencore	0.000131***	0.467055***	0.346663***
Syndicate Bank	0.0000404***	0.161952***	0.799659***
UCO Bank	0.0000616***	0.098512***	0.835147***
UNION Bank of India	0.0000502***	0.157134***	0.796461***
Private Sector Banks			
Axis Bank	0.0000267***	0.099157***	0.880028***
City Union	0.000293***	1.94214***	0.071848***

Bank			
Development Credit Bank	0.0000379***	0.073691***	0.904101***
Dhanlaxmi Bank	0.000131***	0.157046***	0.741351***
HDFC Bank	0.0000419***	0.226906***	0.709895***
ICICI Bank	0.0000285***	0.119556***	0.84908***
Indusind Bank	0.0000738***	0.13045***	0.813251***
ING Vysa Bank	0.00005***	0.070118***	0.870809***
JAMMU & KASHMIR Bank	0.0000363***	0.115589***	0.83994***
Karnataka Bank	0.000352***	0.730943***	0.262698***
KarurVysa Bank	0.000259***	1.88332***	0.104021***
Kotak Bank	0.000495***	0.720846***	0.145629***
Lakshmi Vilas Bank	0.0000807***	0.368856***	0.677147***
South Indian Bank	0.000232***	0.473851***	0.414568***
Vijaya Bank	0.0000771***	0.115276***	0.797671***
YES Bank	0.0000366***	0.126585***	0.842395***
CNX Bank Index	0.00000836***	0.106991***	0.877829***

Note: *, **, *** Statistically significant at 10%, 5% and 1% significance level

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